Chapter 25

Project-Based Learning Integration with Teachers Immersed in a Professional Development Initiative

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ABSTRACT

This chapter focused on the effectiveness of a professional development initiative on the planning, designing, and implementing project-based learning in mathematics, science, and special education classrooms. The purpose was to highlight project-based learning and the development of a professional development learning community that provided unique ways in which teachers engaged with a variety of learning tasks, assessments, and resources while practicing vital mathematics and science skills with diverse students. Attention was given to the importance of teacher attitude and confidence, collaboration, school support, barriers, and increasing student engagement. The case study method was used to amass and probe data. The results indicated valuable suggestions about the effectiveness of professional development for active engagement in project-based learning through networking, differentiating instructional strategies, creating new assessment tools, and gaining content knowledge and pedagogical skills.

INTRODUCTION

Teacher professional development in project-based learning advanced service to the profession by creating effective and scalable teacher supports, resources, and tools while cultivating and improving knowledge, leadership, and accountability with other educational professionals. Through a state grant initiative for project-based learning, the University faculty were able to provide twenty mathematics, science, and special education teachers with five to ten years of teaching experience with tuition-free graduate course credits. The overall goal was to expand the professional skill set designed to teach how to effectively incorporate project-based learning into a classroom setting, giving schools, districts and students the competitive edge.

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The professional development learning community included University faculty, University librarians, and teachers of mathematics, science, and special education. The expansion of the professional development learning community was imperative to successful planning and implementation of project-based learning. The purpose of this study was to insure that teachers, through a professional development initiative, gained knowledge about:

1. The project-based learning process,
2. Investigate, select resources, develop assessments, and experience teaching with project-based learning and differentiation, and then,
3. Design, implement, and assess project-based learning in the classroom to increase student learning within a professional development learning community.

A sequence of three courses was offered to prepare the mathematics, science, and special education teachers in grades four to eight to implement project-based learning. The introductory online course investigated the components of an exemplary project-based learning experience, finding resources, and planning and a tentative project-based learning experience to be implemented. The second course was a week-long, face-to-face summer seminar, where teachers created a driving question, collaborated, and formalized the project to be implemented. The third course focused on the theory and philosophies of Project-Based Learning, observation of the implementation of a project within the teacher participant’s classrooms, and reflection and analysis by the classroom teacher on student achievement. The teachers had the opportunity to earn a total of seven semester-hours of graduate credit for completing the program that could be applied to license renewal and to a Master’s degree.

BACKGROUND

Project-based learning (PBL) is an instructional model based on having students confront real-world issues and problems that they find meaningful, determine how to address them, and then act in a collaborative fashion to create solutions to problems (Barell, 2010). Herron, Magomo, and Gossard (2008) maintained that project-based learning can be defined as an individual or group activity that proceeds over a period of time, resulting in a product, presentation, or performance. Newell (2003) described PBL as emphasizing depth over understanding. Bender (2012) indicated two advantages of Project-based learning that stand out prominently in research:

- Project-based learning increases students’ motivation and interest in completing the work required.
- Given this increased engagement with learning and content, research has shown that student achievement increases in Project-based learning.

Chu, Chow and Tse (2011), ascertained that project-based learning is an instructional strategy that, via participating in a project, appeals to students due to learning by way of problem solving, data collection, and discussion, as well as the presentation of the results as reports. Traditional teaching focuses on increasing knowledge through the memorization of facts and the retention of this new knowledge. Some will argue that there is disconnect between the daily lives that students live and the way they learn. In particular, educators are challenged with a new generation of students expecting a learning environ-
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